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PROBLEMS.

332. *By Prof. M. L. Comstock.*—Find all the values of x and y in the following equations :

$$x^2 + xy^3 = 18, \quad (1)$$

$$xy + xy^2 = 12. \quad (2)$$

333. *By William Hoover.*—Find the value to x terms of the con. fract.

$$\frac{2}{1+2} \\ 1+\&c.$$

334. *By Prof. J. H. Kershner.*—Pairs of tangents which meet always at the same angle are drawn to a given ellipse. Find the envelope of the chords of contact.

335. *Communicated by Pof Root. (from Exam. Prob's, H. Col.)*—The curve whose rectangular equation is $x^{\frac{1}{2}} + y^{\frac{1}{2}} = r^{\frac{1}{2}}$ revolves around the axis of x . Determine the volume of the solid thus described between the limits $x = 0$ and $x = r$.

336. *By George Eastwood.*—In a locomotive engine there are given : The impressed force of the steam on the piston, the radius of the crank, and the length of the connecting rod : To find the uniform force which, if applied at right angles to the end of the crank, would do the same work as the impressed force.

337. *By Prof. Elias Schneider.*—Required the constant quantity into which if we divide the periodic time of any planet, multiplied by its third root, the quotient will be the distance such planet falls from a tangent to its orbit in one second of time : i. e., solve the equation,

$$\frac{\text{Constant Quantity}}{(\text{Periodic Time})^{\frac{1}{3}}} = \text{Fall from tang.}$$

338. *By Prof. Asaph Hall.*—A comet moves around the sun in a given parabolic orbit ; find the right ascension and declination of the point on the heavens towards which the comet approaches as it recedes from the sun and earth.

QUERY BY PROF. J. SCHEFFER.—If of any curve we find the evolute and of the latter the evolute, and so on ad infin., the ultimate evolute is a cycloid. How is this proved?